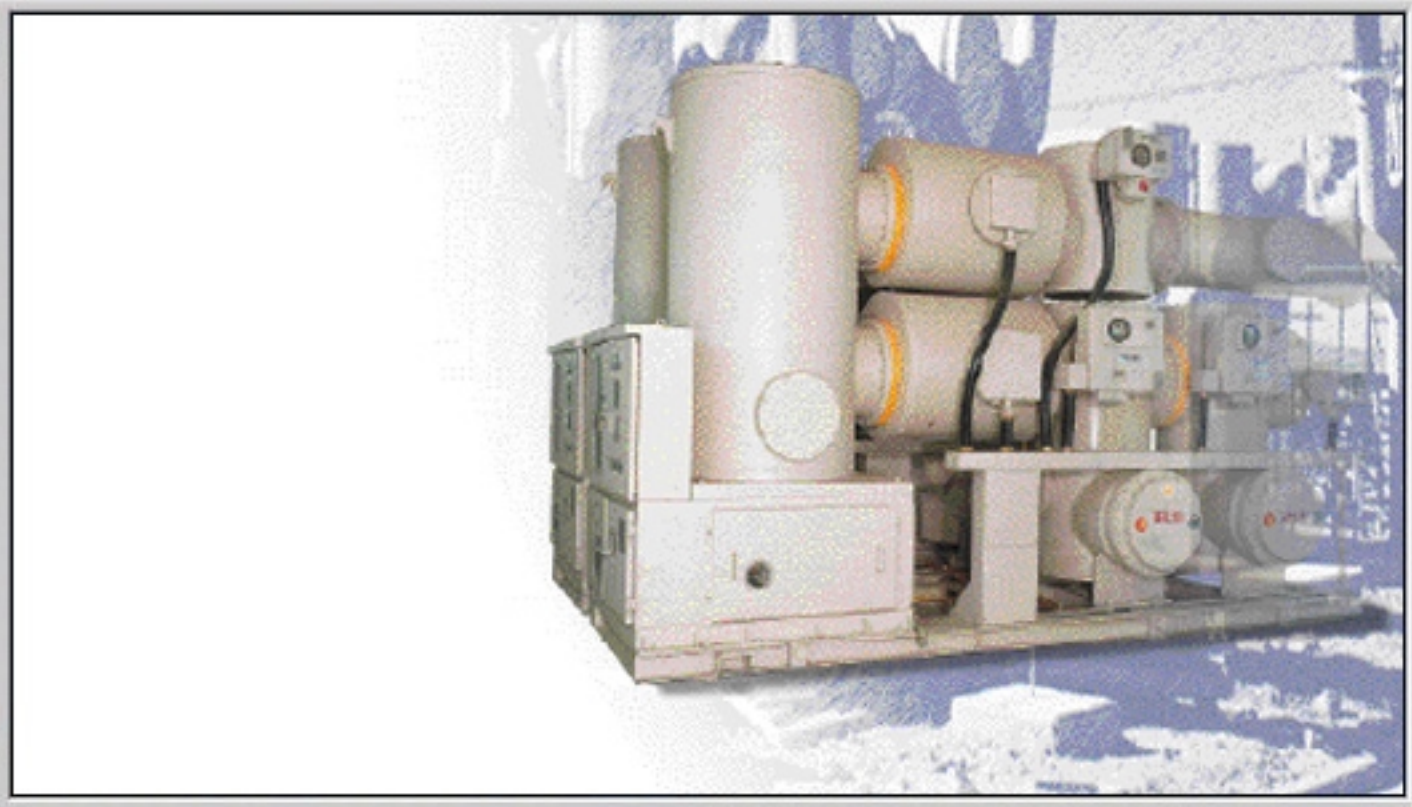
LG SF6 GAS INSULTED SWITCHGEAR (25.8KV-362KV)



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GIS

가스절연개폐장치

SF_6 GAS INSULATED SWITCHGEAR (25.8kV-362kV)

LG

Electric Equipment & Systems

LG산전의 산업전기 기기분야 -
산업발전의 초석, 생산성 향상의 주역입니다.

양질의 안정적인 전기공급은 산업발전의 초석입니다.
LG산전은 이를 위해 각종 수 · 배전반, 부스덕트, 모터컨트롤센터, 초고압 가스절연 개폐설비,
가스차단기, 진공차단기, 변압기, 배선용차단기, 저압개폐기 등 저압에서 고압에 이르는
다양한 산업용 전기 기기를 생산 · 공급하고 있습니다.
또한 지속적이고 과감한 R&D 투자를 통하여 세계일등제품을 개발하고 있습니다.

LGIS is working hard to satisfy each of our customers by providing the equipment & systems necesssary for a stable power supply and maximum energy efficiency.

Our electric equipment & systems are world class, evident by the efficient design and quality of its products. Global quality assured by international certifcations, such as ISO 9001,
ISO 14001 and international Compliance codes : IEC, UL, ANSI, JIS.
In this highly competitive arena, the electric equipment & systems group will aggressively take the initiative on the world market by introducing new-concept products and reinforcing activities aimed at lowering production costs and improving product quality.

C O N T E N T S

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사 양 (Specification) ····· 6P ~ 7P
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36-72.5kV····· 10P ~ 11P
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170kV····· 14P ~ 15P
275-362kV····· 16P ~ 17P

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SF_6 GAS INSULATED SWITCHGEAR

■ **Chungjoo Plant** - 215,836㎡

- Number of Employees : 1,660
- Major Products : GIS, IPB, SWITCHGEAR, VCB, ACB, MCB, MCCB, Transformer, SCADA etc.
- Address : #1, Song Jung - Dong, Hung Duk-Ku, Chungjoo - City, 361-290, Korea

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LG GIS 의 특징 (Features)

유압조작방식의 채택
Hydraulic Operating Mechanism

유압조작방식은 공기조작방식에 비해 크기는 소형인 반면에 큰 조작력을 낼 수 있기 때문에 Puffer 형 CB에 적합하고, 부품이 대기중이 아닌 오일내에서 작동하기 때문에 이물질로 인한 오손의 염려가 없습니다. 또한, 조작기에 대한 유지 · 보수가 매우 간단하며, Steel재질의 Valve Sheet를 사용함으로써 수명이 반영구적입니다.

The electro hydraulic operating mechanism is suitable for puffer type CB because of the small size with large operating power compared with pneumatic operating mechanism. Since all the components operating in the oil, not in air there is no worry about damage.
The maintenance and inspections for operating mechanism are very simplified, and the valve seal of oil system is made of metal sheet, which is good for permanent use without necessity of replacement.

3상 일괄형
3-Phase-Encapsulated Enclosure

3상분리형에 비해 Flange Gasket의 전체길이가 작기 때문에 Gas누설에 대한 안전성이 뛰어나며, 부품점수가 적어 제품에 대한 신뢰성이 우수합니다. 또한 탱크내에 삼상도체가 설치되기 때문에 통전시의 온도 상승이 매우 작습니다.

With small size of flange gasket than single-phase isolated systems provides high stability to gas leakage, and has a high reliability as decreasing components less than 60 percent compared to single-phase isolated GIS. With arrangement of three-phase conductors inside enclosure the temperature increasing rate is very small.

고도의 신뢰성
High Reliability

주요 부분이 SF_6 Gas가 충전된 압력용기속에 밀봉되어 주위의 오염물질이나 기후변화에 대한 영향을 받지 않으며, 장기간 사용에도 절연열화의 우려가 없습니다. 또한, 만일의 경우 내부사고 발생시에도 가스구획이 구분되어 있어 사고확산을 방지 할 수 있습니다.
조작장치의 Lever가 외부로 노출되지 않도록 구성되어 있으므로 결빙등에 의한 동작불능등의 현상이 발생되지 않습니다.

Since main parts of switchgear is sealed with SF_6 Gas it's free from environmental pollution and climatic change, and there's no care about dielectric deterioration by long time operation. The diffusion of accident will be prevented by Gas Section in the case of internal accident.
As the operating lever is designed to fit in such manner not to be exposed outside, malfunction caused by freezing and so on can be prevented.
The merit when adapting an operating method by oil pressure is that it can be used almost permanently owing to the main components composed together within the oil which lessen the concern for aging and wearing off.

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LG GIS 의 특징 (FEATURES)

설치 및유지 · 보수의 용이
Easy Installation and Maintenance

제품의 소형화로 현장수송이 용이할 뿐만 아니라 Conventional Type에비해 설치가 매우 간단하기 때문에 설치기간이 대폭 단축됩니다. 또한 증설 작업시에도 정전없이 설치작업이 가능할 뿐만 아니라, 주요 부분들이 SF_6 Gas속에 밀폐되어 있어 외부환경의 영향을 받지 않으므로 운전중에도 유지 · 보수가 가능합니다.
유압조작방식의 조작기 채용으로 인하여 압축공기 발생장치와 같이 주기적인(주1회이상) 점검이 불필요합니다.(무인화, 무보수화, 무정검화 추진)

Compact product size makes it possible to shorten the installation period remarkably due to its far more simple installation method than conventional type as well as for easy transportation to site.
In addition, installation without power shut down become possible for expansion works in the future and maintenance works is possible during operation because main components are concealed within SF_6 Gas without being influenced by outside factors.
Unlike pneumatic generator, no regular check (more than 1 time a week) is required-featuring the maintenance free type.

안 전 성
High Safety

금속제 탱크가 완전히 접지되어 있고 충전부가 노출되어 있지 않기 때문에 접촉사고 및 정전유도의 염려가 없으며, SF_6 Gas는 불연성으로서 화재에 대한 염려가 없습니다.
조작장치의 구동 Lever가 금속제 탱크내에 내장되어 있으므로 조작시 인체에 위해를 가하지 않는 구조입니다.

With metal tank completely earthed and recharging section not exposed outside, not only capacitative induction and contact incident can be avoided, but also fire prevention is accomplished by using flame retardant SF_6 gas.
As controlling lever is not exposed outside, there is no danger to operator's body when controlling.

용지 확보의 용이성
Easy Securing Area

절연내력이 우수한 SF_6 Gas를 충진한 금속제 탱크내에 모든기기들을 내장 시키므로, 기존의 Conventional Type에 비하면 점유면적이 현저히 축소(1/3~1/15정도)되어 도시의 밀집지역이나 용지확보가 용이하지 못한 장소에도 적합합니다.

LG IS's GIS takes much less area & space for installation than the conventional type because of drastic reduction of required area for its compact size mainly by integrating all the components within the metal SF_6 Gas filled-tank which is excellent for di-electric characteristics. It is suitable particularly in a dense areas like city and a place where large space and area are not available.

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사 양 (Specification)

형 식 Type	단 위	GESG0225	GESG0320	GESG0720	GESG1240	GESG1440
적용규격 Standard		IEC517/PS150				
정격전압 Rated Voltage	kV, rms	25.8	36	72.5	123	145
접지계수 Earth Fault Factor		1.5	1.5	1.5	1.5	1.5
주 파 수 Frequency	Hz	50/60	60	60	50/60	50/60
정격단시간전류 Rated Short-Time WithStand Current	kA, rms	25	20	25, 31.5	40	40
단시간전류통전시간 Duration	sec.	1	1	1	3	3
절연내력 Insulation Level						
- 상용주파 내전압 Power Frequency WithStand Voltage	kV, rms	50	70	140	230	275
- 뇌임펄스 내전압 Lightning Impulse Withstand Voltage	kV, peak	125	200	325	550	650
- 개폐임펄스 내전압 Switching Impulse Withstand Voltage	kV, peak	N/A	N/A	N/A	N/A	N/A
- 재단파 내전압 Chopping Wave Withstand Voltage	kV,peak	N/A	N/A	N/A	N/A	N/A
모 선 Bus						
- 정격전류 Rated Current	A, rms	2,000	2,000	2,000	2,000	2,000
- 정격 SF_6 Gas 압력 Rated SF_6 Gas Pressure	kgf/㎠ · G at 20°C	0.5	5	5	5	5
차단기 Circuit Breaker						
- 차단방식 Type	-	V.I	PUFFER Type			
- 정격전류 Rated Current	A, rms	600(630)	800,1200(1250)	1200(1250), 2000, 3000(3150)		
- 정격차단전류 Rated Breaking Current	kA, rms	25	20	20	40	40
- 차단점수 Number of breaks	-	1	1	1	1	1
- 정격차단시간 Rated Breaking Time	cycle	5	3	3	3	3
- 표준동작책무 Rated Operating Sequence		O-0.3Sec-CO-3MIN-CO				
- 조작장치(투입/차단) Operating Mechanism(Closing/Tripping)	-	전동스프링 (Motor Charged Spring)	유 압(Hydraulic), 전동스프링(Motor Charged Spring)		유 압(Hydraulic)	
- 정격 SF_6 Gas 압력 Rated SF_6 Gas Pressure	kgf/㎠ · G at 20°C	0.5	5	5	5	5
단 로 기 Disconnecting Switch						
- 정격전류 Rated Current	A, rms	600(630),2000	800,1200 (1250)	1200(1250), 2000, 3000(3150)		
- 조작장치 Operating Mechanism		전동(Motor), 전동스프링(Motor Charged Spring), 수동(Manual)				
- 정격 SF_6 Gas 압력 Rated SF_6 Gas Pressure	kgf/㎠ · G at 20°C	0.5	5	5	5	5
접지개폐기 Earthing Switch						
- 조작장치 Operating Mechanism		전동(Motor),전동스프링(Motor Charged Spring), 수동(Manual)				
- 정격 SF_6 Gas 압력 Rated SF_6 Gas Pressure	kgf/㎠ · G at 20°C	0.5	5	5	5	5
제어전압 Control Voltage	V, DC V, AC	100/110/125 220/380				

사 양 (Specification)

형 식 Type	단 위	GESG1730	GESG1750	GESG2440	GESG3640	GESG3663
적용규격 Standard		IEC517/PS150				
정격전압 Rated Voltage	kV, rms	170		245	362	
접지계수 Earth Fault Factor		1.3		1.5	1.3	
주 파 수 Frequency	Hz	60		50/60	60	
정격단시간전류 Rated Short-Time Withstand Current	kA, rms	31.5	50	40	40	63
단시간전류통전시간 Duration	sec.	1/2	1	1	1	1
절연내력 Insulation Level						
- 상용주파 내전압 Power Frequency Withstand Voltage	kV, rms	325		395	450	
- 뇌임펄스 내전압 Lightning Impulse Withstand Voltage	kV, peak	750		950	1175	
- 개폐임펄스 내전압 Switching Impulse Withstand Voltage	kV, peak	N/A		N/A	950	
- 재단파 내전압 Chopping Wave Withstand Voltage	kV, peak	N/A		N/A	1300	
모 선 Bus						
- 정격전류 Rated Current	A, rms	3000(3150), 4000		3,150	4,000	8,000
- 정격 SF_6 Gas 압력 Rated SF_6 Gas Pressure	kgf/㎠ · G at 20°C	5		5	5	
차단기 Circuit Breaker						
- 차단방식 Type		PUFFER Type				
- 정격전류 Rated Current	A, rms	1200(1250),2000,3000(3150),4000		2000, 3000(3150), 4000, 8000		
- 정격차단전류 Rated Breaking Current	kA, rms	31.5	50	40	40	63
- 차단점수 Number of breaks		1		1, 2	1, 2	1, 2
- 정격차단시간 Rated Breaking Time	cycle	3		3	3	
- 표준동작책무 Rated Operating Sequence		O-0.3Sec-CO-3MIN-CO				
- 조작장치(투입/차단) Operating Mechanism(Closing/Tripping)		유압(Hydraulic)				
- 정격 SF_6 Gas 압력 Rated SF_6 Gas Pressure	kgf/㎠ · G at 20°C	5	6	5	5	6
단 로 기 Disconnecting Switch						
- 정격전류 Rated Current	A, rms	1200(1250),2000,3000(3150),4000		2000, 3000(3150), 4000, 8000		
- 조작장치 Operating Mechanism		전동(Motor), 전동스프링(Motor Charged Spring), 수동(Manual)				
- 정격 SF_6 Gas 압력 Rated SF_6 Gas Pressure	kgf/㎠ · G at 20°C	5		5	5	
접지개폐기 Earthing Switch						
- 조작장치 Operating Mechanism		전동(Motor), 전동스프링(Motor Charged Spring), 수동(Manual)				
- 정격 SF_6 Gas 압력 Rated SF_6 Gas Pressure	kgf/㎠ · G at 20°C	5		5	5	
제어전압 Control Voltage	V, DC V, AC	100/110/125 220/380				

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Construction of 25.8KV

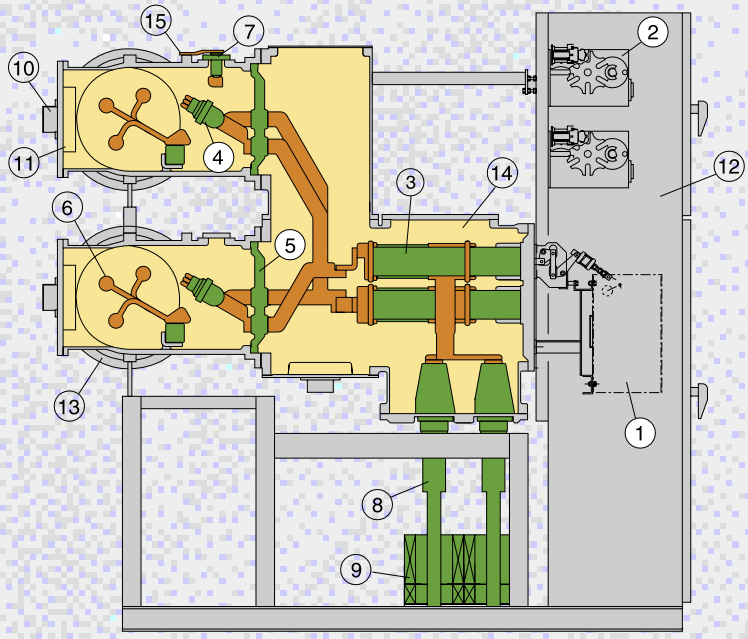
LG GIS 의 구조 (Structure)

본체의 정면부는 조작기 취부 및제어 Panel로 구성되어 있고, 차단부의 하부는 Cable단말부 또는 Solid Busbar를 배치하였습니다.
특히 보수, 점검의 편의를 위하여 차단부의 분해, 점검 및 재조립이 가능합니다.
CT는 관통형 Mold CT를 채용, Cable단말부 후단의 기중(氣中)에서 처리하여가스를 빼지않고도 Tap변경 또는 교체가 가능합니다.
주회로부는 차단기실, 모선+단로기실로 되어 있는데 각각 가스용기에 수납되어 있습니다.
이 가스용기는 고객의 다양한 회로구성에 적용가능토록 표준 Flange를 채용하여 호환성을 갖고 있습니다.
또한 만일의 사고에 대비하여 내부 Arc에 의한 압력을 외부로 쉽게 방출할 수 있도록 방압안전장치인 Rupture Disc를 설치하였습니다.
Cable 단말부는 가스용기와 완전히 밀봉된 Cable-Plug-in System을 사용하였으므로 절연성능이 극히 우수하여 절연노화의 우려가 없습니다.

Front body comprises controlling and operating section, and Solid Busbar or cable termination positioned at lower part of CB section. Particularly, for the sake of convenience in regular check and maintenance Hand Hole is installed at the upper part of CB section enabling easy access to CB section for disassemble, check up and assembling works.
Adapting penetration mold type CT, placed at the rear part of cable termination part under air pressure, it is possible to change or replace Tap without taking the Gas out of tank.
Main circuit section comprises CB compartment, Busbar + DS compartment which are concealed under Gas container. This gas container provides inter changeability by adapting standard Flange to cope with various circuit formation required from the customer. In addition, in preparation of accident, Rupture Disc-safety device against pressure has also been equipped inside to relieve the inner pressure caused by Arc incident by emitting the pressure outward easily.
Cable termination part is composed of cable plug in system completely separated from the Gas container which provides highly excellent insulation. There fore there is no need to be concerned over weakening the insulation by aging .

Descriptions

NO	명 칭(Name)
1	CB조작기(Operating Device)
2	3Way S/W 조작기(Operating Device)
3	Vacuum Interrupter
4	3Way S/W
5	절연 Spacer
6	모 선(Bus)
7	접지(Earthing) Bushing
8	Solid Busbar/Cable
9	CT
10	방압판(Pressure Relief Device)
11	Absorbent
12	제어반(Control Panel)
13	DS/ES Unit
14	CB Unit
15	Earth Bus Bar



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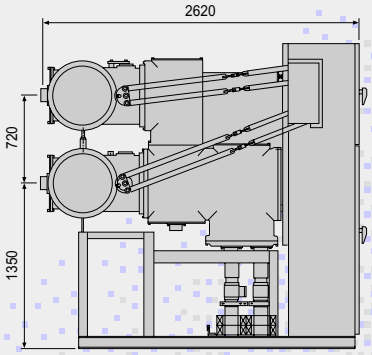
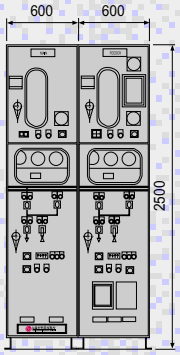
복모선 Double Bus

Main & Feeder Circuit

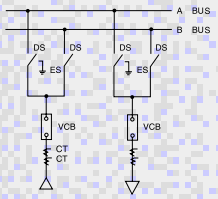


Side View



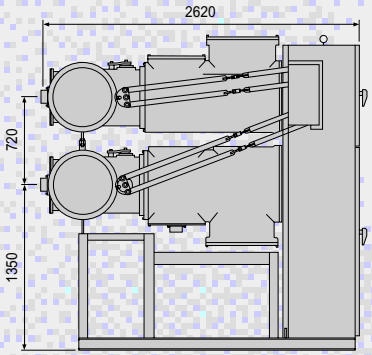
Front View

Main(2000A) Feeder(600A)

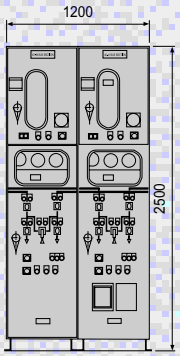


One-Line Diagram

Bus Section Circuit

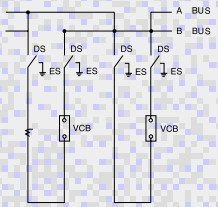


Side View



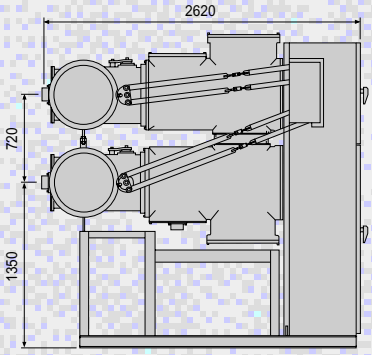
Front View

Bus Section(2000A)

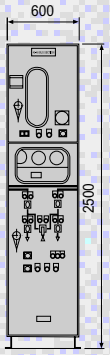


One-Line Diagram

Bus Section Circuit

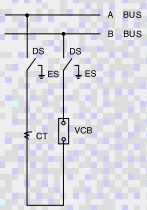


Side View



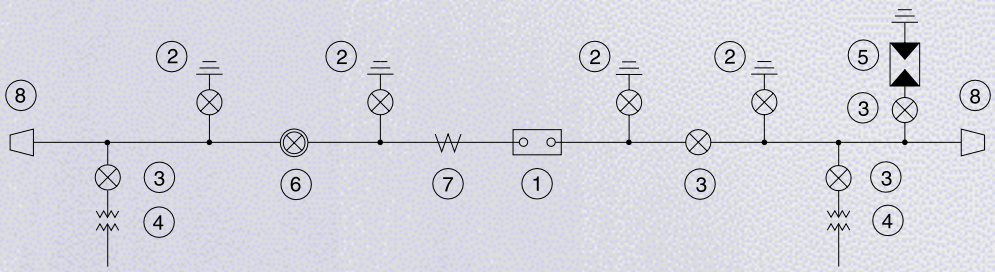
Front View

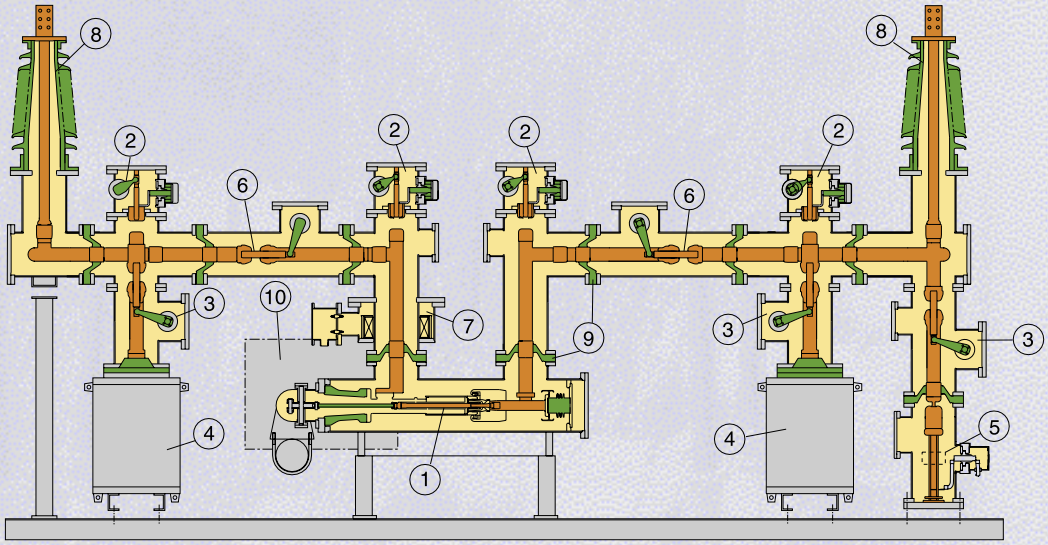
Bus Tie(2000A)



One-Line Diagram

Construction of 36-72.5KV





Descriptions

NO	명 칭(Name)	NO	명 칭(Name)
1	Circuit Breaker	6	Motor Operating Disconnecting Switch
2	Manual Operating Earthing Switch	7	Current Transformer
3	Manual Operating Disconnecting Switch	8	Bushing
4	Potential Transformer	9	Insulating Spacer
5	Lightning Arrester	10	Operating Machanism for CB

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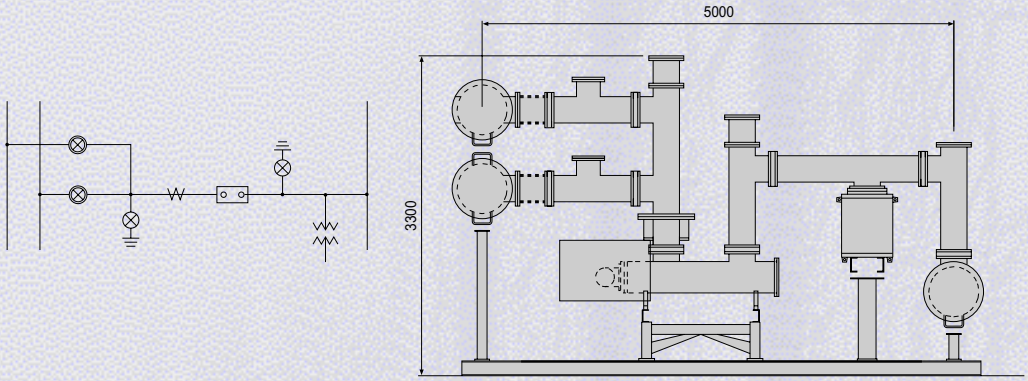
복모선 Double Bus

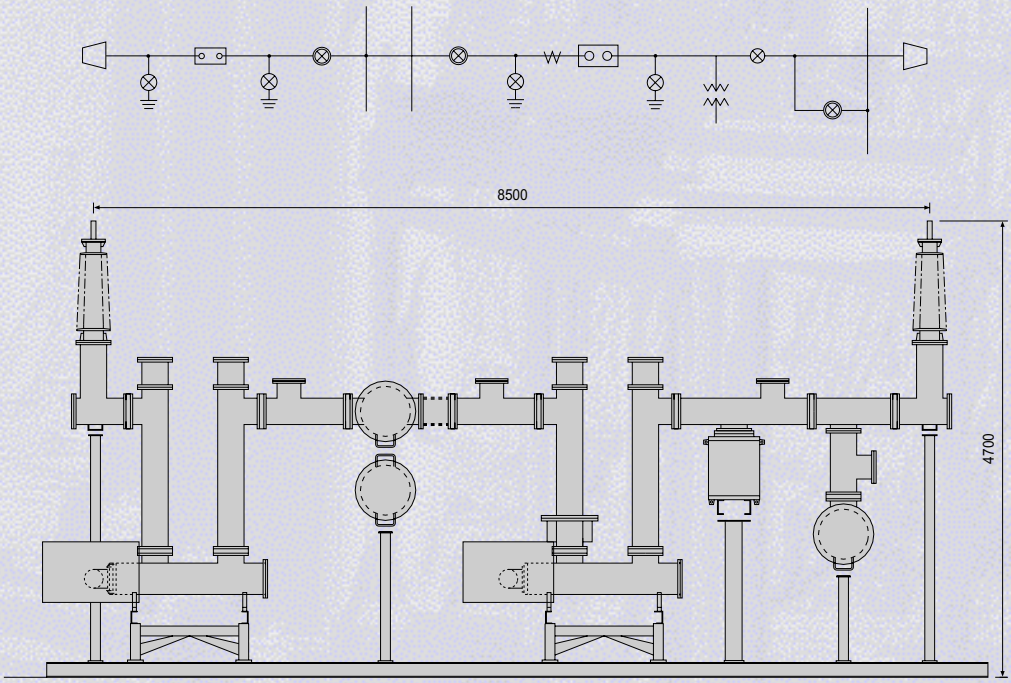
■ Bay Width :

Bus Tie Feeder

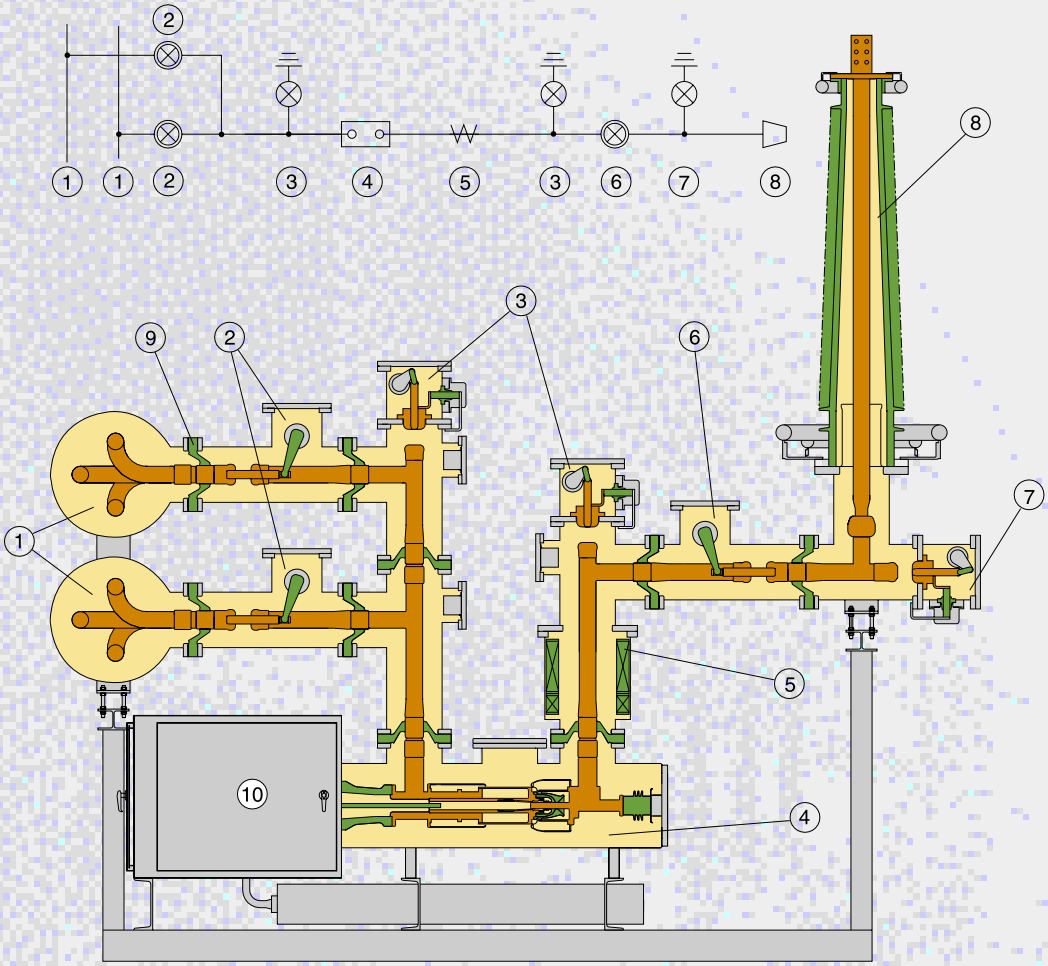


T/L Feeder

T/R Feeder



Construction of 123-145KV



Descriptions

NO	명 칭(Name)	NO	명 칭(Name)
1	Main Bus	6	Line Disconnector
2	Bus Disconnector	7	Earthing Switch for Make-Proof
3	Earthing Switch for Maintenance	8	Bushing
4	Circuit Breaker	9	Insulating Spacer
5	Current Transformer	10	Operating Mechanism for C.B

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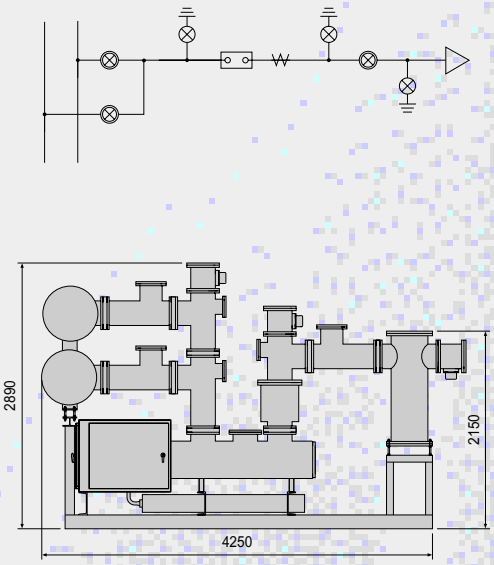
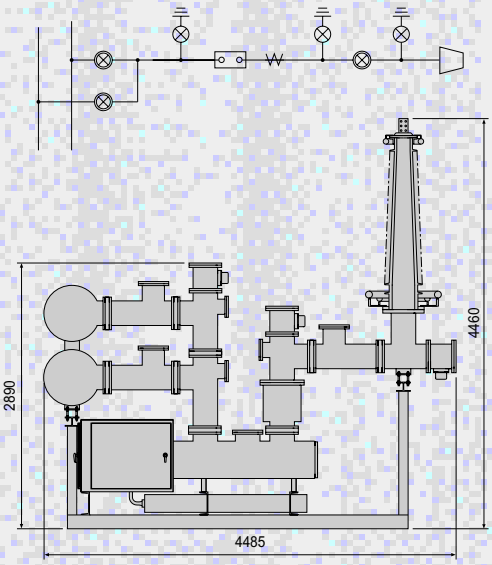
복모선 Double Bus

■ Bay Width :

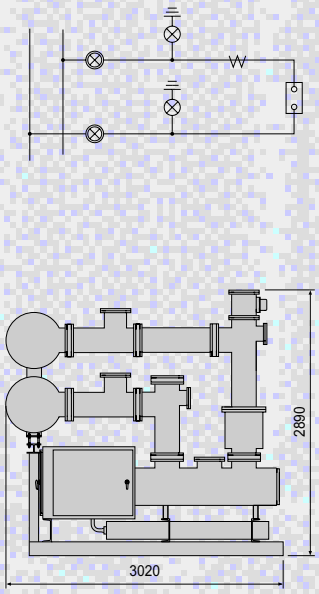
Double Bus(Cable Head)



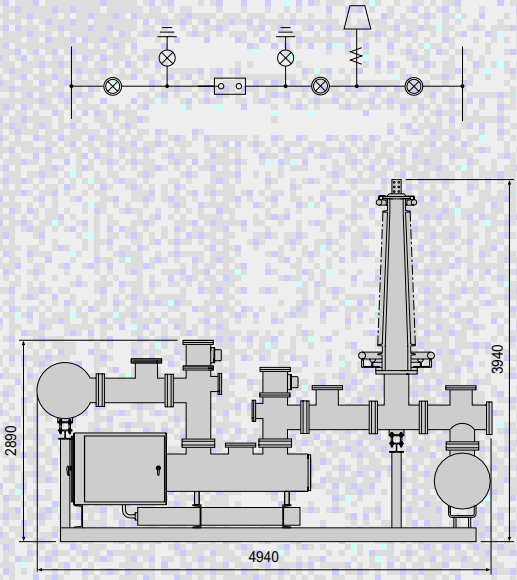
Double Bus(Gas To Air Bushing)



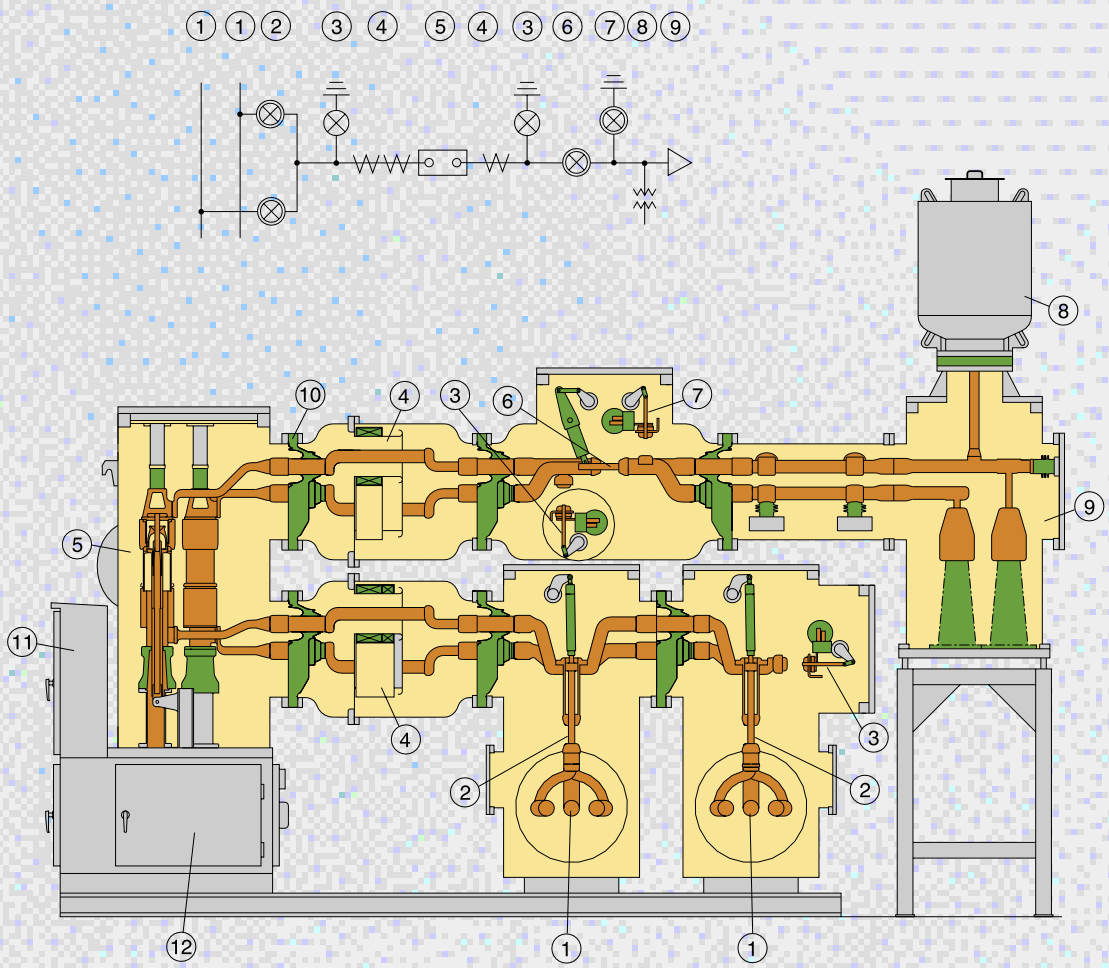
Bus Coupler



Bus Section



Construction of 170KV



Descriptions

NO	명 칭(Name)	NO	명 칭(Name)
1	Main Bus	7	Earthing Switch for Make-Proof
2	Bus Disconnector	8	Voltage Transformer
3	Earthing Switch for Maintenance	9	Cable Head
4	Current Transformer	10	Insulating Spacer
5	Circuit Breaker	11	Local Control Panel
6	Line Disconnector	12	Operating Mechanism for C.B

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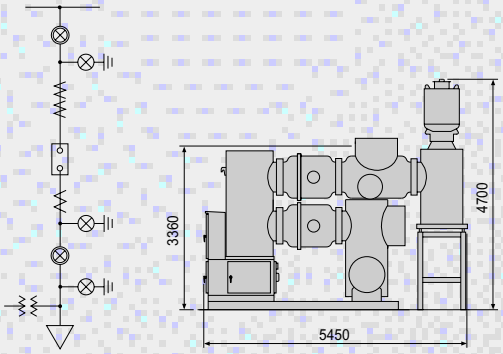
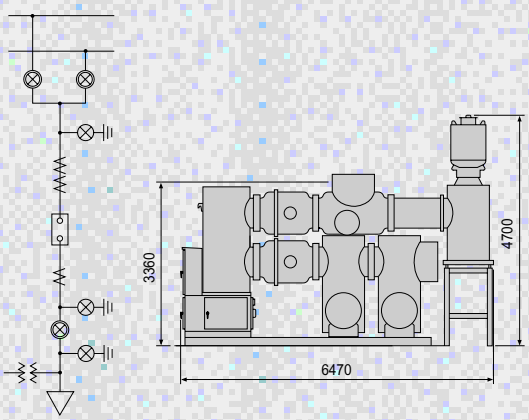
복모선 Double Bus

■ Bay Width :

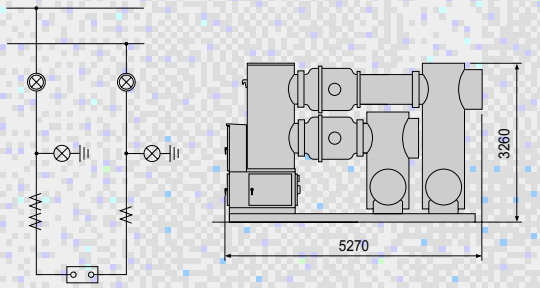
Single Bus



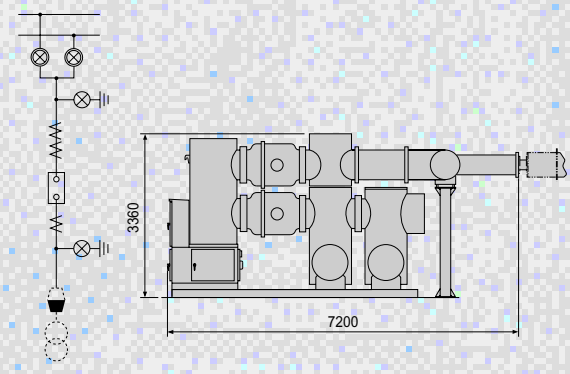
Double Bus



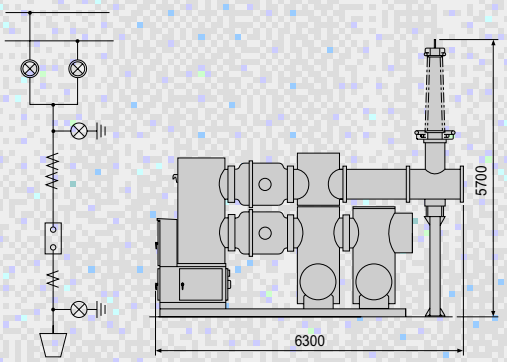
Bus Tie



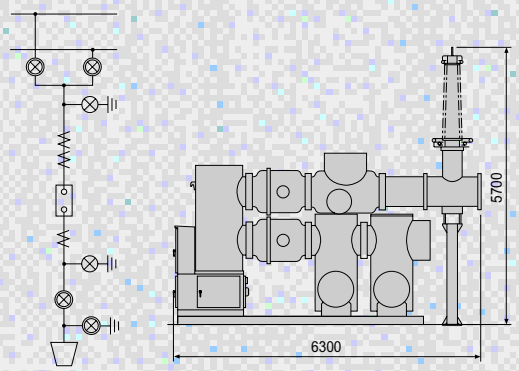
Transformer Feeder(Gas to oil Bushing)



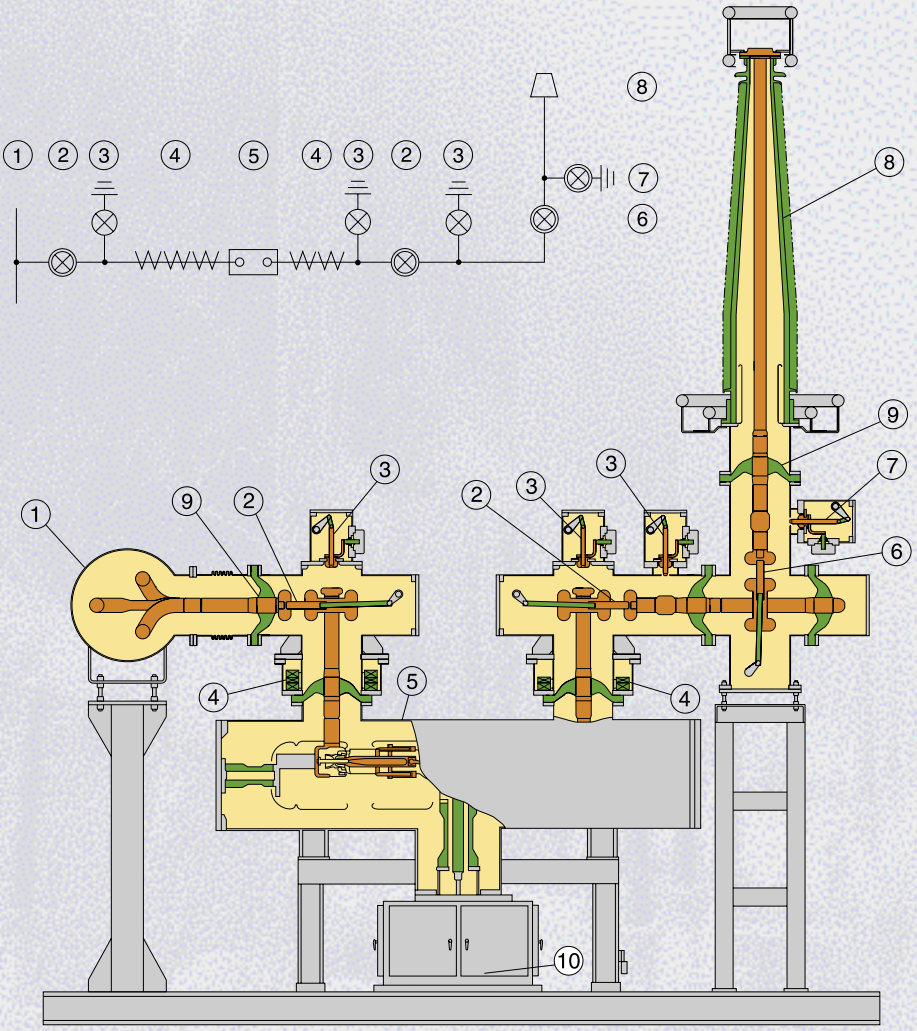
Overhead Line T/R Feeder(Gas To Air Bushing)



Overhead Line T/L Feeder(Gas To Air Bushing)



Construction of 275-362KV



Descriptions

NO	명 칭(Name)	NO	명 칭(Name)
1	Main Bus	6	Line Disconnector
2	Bus Disconnector	7	Earthing Switch for Make-Proof
3	Earthing Switch for Maintenance	8	Bushing
4	Current Transformer	9	Insulating Spacer
5	Circuit Breaker	10	Operating Mechanism For C.B

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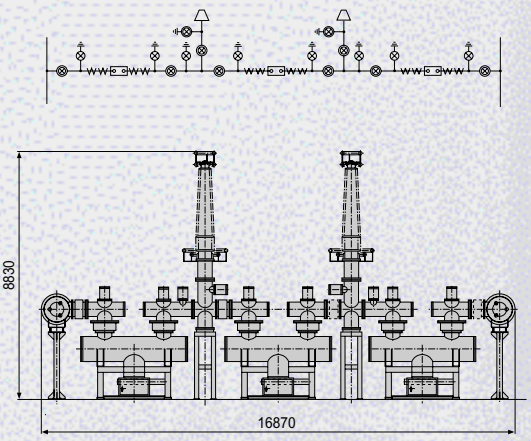
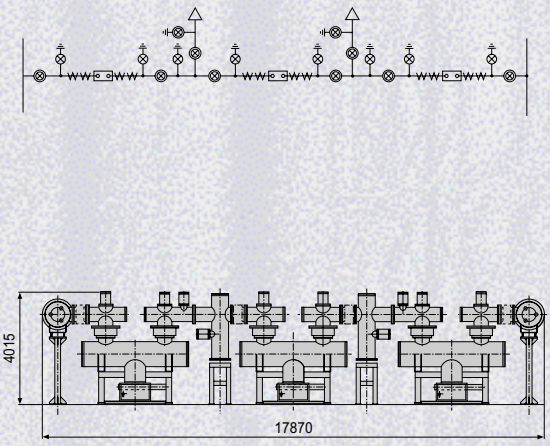
복모선 Double Bus

■ Bay Width :

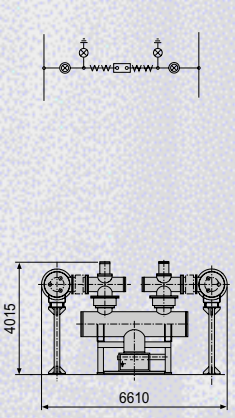
Double Bus Feeder(1 ½CB Bushing



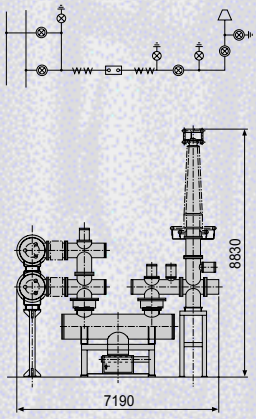
Double Bus Feeder(1 ½CB Cable Head



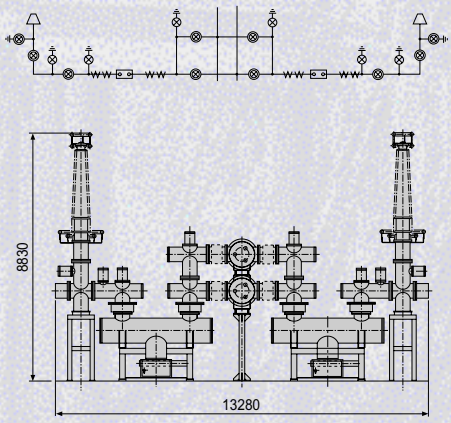
Bus Tie



Double Bus Feeder



Double Bus Feeder



구 매 시 방 서

1. 일반 General

주위온도 Ambient Temperature : ℃

적용규격 Standard : .

정격전압 Rated Voltage : kV

정격주파수 Rated Frequency : Hz

상용주파 내전압 Power Frequency Withstand Voltage : kV

뇌임펄스 내전압 Lightning Impulse Withstand Voltage : kV

제어전압 DC : V

AC : 1ø V

3ø W V

2. 모선 Bus

정격전류 Rated Current : A

정격단시간전류 Rated Short Time WithStand Current : kA

단시간전류 통전시간 Duration : Sec

3. 차단기 Circuit Breaker

정격전류 Rated Current : A

정격단시간전류 Rated Short Time Current : kA

단시간전류 통전시간 Duration : Sec

정격차단전류 Rated Breaking Current : kA

정격차단시간 Rated Breaking Time : cycle

표준동작책무 Rated Operating Sequence : .

4. 계기용변압기 Voltage Transformer

정격1차전압 Rated Primary Voltage : kV

정격2차전압 Rated Secondary Voltage : V

정격부담 Rated Burden : VA

오차계급 Accuracy Class : .

5. 계기용변류기 Current Transformer

정격1차전류 Rated Primary Current : A

정격2차전류 Rated Secondary Current : A

정격부담 Rated Burden : VA

오차계급 Accuracy Class : .

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